

# The Planters' Chronicle.

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## THE U. P. A. S. I.

(INCORPORATED.)

### Contents.

We have been compelled through want of space to keep over till the next issue the continuation of Consul Osborne's report on the position of coffee at Havre.

An interesting report, through the kindness of the Government Entomologist, on Bees and the Fertilization of Coffee is published, and we hope that Bee Keeping will become common amongst planters, seeing how valuable their work is in fertilizing the flowers. The production of honey will have to be a secondary consideration.

The Scientific Officer publishes an article on Methods of applying manures, and advocates, with unanswerable reasons, the broadcasting system.

We publish under the heading of Correspondence a letter from Sakhalin, which we trust is but the *avant-courier* of others from other planting districts.

Under the heading of the Labour Question, two letters are printed, which do not, however, throw much light on the subject, as they are more particular than general. The horizon of the writers is too limited. We want letters that shall benefit the whole planting community, not one particular locality.

A good deal of attention is being paid to the opening of land by means of explosives, and we have the pleasure to publish a letter from an old Mysore planter on the subject, and shall hope to revert to it again when more data are at our disposal.

It is with great pleasure that we publish the fact that Mr. Anstead, our Planting Expert, has been nominated to a seat on the Board of Agriculture, originally consisting of 25 members the Board has been increased to 33. The well merited honour conferred on Mr. Anstead will be welcomed by all members of the Planting Community, as a recognition of the good work done by him in South India.

Next week we shall publish a circular from the Indian Tea Association asking all Tea Companies and Proprietors to print the words "Pure Indian Tea" on their Tea chests next season. It will serve not only to draw attention to the purity of Indian Tea but act as a valuable means of advertising.

## BEES AND THE FERTILISATION OF COFFEE

*Continued.*

*Report of the Government Entomologist on a tour in the Shevaroyis.*

"I left Headquarters on the evening of 13th October, arriving at Salem the same night and proceeded next morning to Yercaud. Here I examined some coffee and in the evening went on to Hopeville Estate.

"On 15th I visited Kadiar Rocks, a high rocky cliff to which the wild Bees (*Apis dorsata*) suspend their combs, whence a large quantity of honey and wax is collected yearly. In the evening I visited Arcadia Estate, where a few colonies of *Apis indica* have been kept in English hives, but unfortunately these had all swarmed and deserted the hives just prior to my visit. Investigation of the combs showed that Wax Moth (*Galleria mellonella*) had effected an entrance. (See *Agricultural Journal of India*, October 1911).

"On 16th I observed flower-haunting insects and did some general collecting, visiting Swinton Estate and Scottforth Estate, to see local conditions and make general observations on insects.

"On 17th I proceeded to Valalakadai Peak Estate, collecting and observing in the intervening country.

"On 18th I observed flower-haunting insects, gathered information regarding bees, and saw and advised on various pests of Coffee, Orchard and Garden Crops. It was a wet misty day very unfavourable for collecting or observing insects. At about 6-30 p.m. a sharp earthquake shock, lasting about 1 second, was felt here.

"On 19th, as the N. E. Monsoon seemed to have set in and it was misty and raining hard, I left for Yercaud, reaching there the same afternoon.

"On 20th (Sunday) I halted at Yercaud. It was a misty, wet, cold day and few insects could be found but I was able to obtain several interesting species.

"On 21st it was still wet and unfavourable and I left in the afternoon for Salem and arrived back at Coimbatore on the morning of 22nd October.

"Three species of true Honey-Bees (*Apis dorsata*, *indica*, and *florae*) appear to occur in the Shevaroyis. I omit consideration of a fourth reported species, which is evidently a *Melipona*. Of these I was unable to come across a single specimen of *Apis florae*, and neither of the other two species was at all common. The absence of Bees in these Hills at the time of my visit was indeed remarkable. During the last three or four days the weather was, it is true, extremely unfavourable, yet even this would hardly account for the almost total absence of bees, and I am inclined to suppose that *Apis dorsata* (and perhaps *A. indica*) also migrate from these Hills into the Plains during about July-November. This would be in accordance with the habits of *A. dorsata* elsewhere (notably at Sabour, in Bihar, as Mr. Woodhouse has informed me) but further observations are desirable, as the point is of course not only interesting from a bionomic viewpoint but also of practical importance in considering the damage to these bees caused by the present methods of collecting honey and bees wax.

"The right to collect these is leased out by the Forest Department, usually to Malayalis living in adjacent villages. The Bees (by which I refer

to the large Rock-Bee, (*Apis dorsata*) suspend their large single combs from the lower surface of inwardly sloping rocks, which occur usually as high cliffs rising for 200 or 300 feet. As these combs are usually affixed to overhanging rocks near the top of such a cliff, the honey-gatherers, generally climb down by a rope ladder fastened from the top. Occasionally the ladders break, or the gatherers are so badly stung that they lose their hold and drop, being dashed to pieces on the rocks below. They are provided with a blanket and a torch, with which they burn the bees off the combs, which are then cut and collected. The destruction of bees by this process, which takes place in May-June, is enormous, as I am informed by all observers. At the same time, I am doubtful whether the honey and wax could be collected without the destruction of the bees, which would otherwise pursue the plunderers of their stores and exact full vengeance on their disturbers.

"*Apis dorsata* seems to be a fierce and intractable bee whose habit of building a single large comb unfits it for domestication. Its migratory habits also, if these are established, form an obstacle from an apicultural viewpoint.

"*Apis indica*, a bee rather similar to, but smaller than, the English Honey Bee, builds its nest as a rule in hollow trees, where it forms several parallel combs. It can be tamed, although it is very subject to attack by Wax moth whereupon it usually deserts the nest and swarms off elsewhere, so that it is rare to induce a colony to remain in one hive for more than a few months. The ordinary English Bar Frame Hive and Foundation Comb, being made to suit the larger European Bees, are hardly suitable for *Apis indica*, whose combs are smaller, averaging about 33 cells in a inch, whereas European combs run to about 27. This difficulty may be overcome by the use of specially made Foundations and I am writing to Colombo to make inquiries regarding the availability of such for Indian Bee-keepers, as I understand that the Ceylon Apicultural Society has recently obtained a Foundation Machine specially built to suit *A. indica*. This bee offers the most likely subject for trial in domestication amongst the native Indian Bees, although, as remarked above, it is not altogether satisfactory. It is at times rather a vicious species, resorting to interference and manipulation, and that also is a point against a King Coffee Planter's endeavour to domesticate it. I presume that its Honey and Wax are covered by the term "Forest Products" but I am unaware whether collection of products of this variety is included under the Licences granted by the Forest Department. In any case, it would prove most difficult to enforce protection for this bee, as it builds almost anywhere in the jungle whereas a suitable hollow tree is to be found and is not confined to special localities as is the Rock Bee.

"*Apis florea* occurs in the Shencroys by all accounts, although I have none at all. It builds a small single comb rarely more than six inches broad by twelve deep (often smaller) and is quite unsuitable for domestication. It usually hangs its comb from a branch of a bush, where it is easily found and taken and this habit renders it, since *A. indica*, very difficult to protect by any legislation. It is, though small, a most active little worker and might do a great deal of good in the pollination of flowers. Its store of Honey is so small that it is not likely to be taken for commercial purposes but would doubtless be secured for present eating by Jungle Tribes.

"Although very few bees were to be seen at flowers by day, in the evening numerous moths, notably *Nephrole hespera* and *Protoparce convolvuli*, were attracted, whilst in the daytime *Macroglossum* spp. also darted around the blossoms. It will of course be necessary to determine by actual experi-

ment and observation, when the coffee flowers next April, what proportion of flowers are actually fertilised by Bees, but I rather expect to find that other insects (such as the Sphingids named above) will be found to have a large share in fertilizing them.

"Green Bug (*Lecanium viride*), which was first noticed in the Shevaroy about six years ago, is now widely distributed. In no part, however, does it seem to be doing really virulent harm such as I saw in the Anamalais in January last, and in many places it seems to have disappeared (or practically so) from the patches on which it has occurred. Doubtless climatic conditions have a good deal to do with the difference in the amount of damage it does to coffee. Probably it was introduced into the Shevaroy with Fruit trees or Garden plants. In this connection it may be noted that, when touring by rail, I often see at Railway Stations consignments of plants and young trees, (Mangoes etc.) being sent by rail and that it is very rarely indeed that I am unable to detect Scale Insects or other pests being carried with them.

"Coffee Borer (*Xylotrechus quadripes*) occurs commonly in the Shevaroy but apparently does not cause any great damage. It is dealt with by cutting out the affected parts.

"Root Rot attacks the Coffee trees in many parts and is doubtless attributable to the large quantity of dead and decaying wood which lies about almost everywhere.

"*Hemitecia vastatrix* is common, especially around Yercaud. I found a minute yellow larva (apparently Dipterous) which was apparently feeding on the spores, but unfortunately the specimens collected all died. This would perhaps repay further investigation."

#### Note.

In Scientific Officer's Paper No. 115 in the last number of the *Chronicle*, on the subject of Bees and Coffee Fertilisation, the following corrections should be made:—

p. 27, last line but one, 'active bee' should read *native bee*.

p. 28 line, line 9, '1911' should be 1912.

The Government Entomologist has kindly contributed the following comments on this Paper:—

"It is not strictly accurate to say that no native bee 'will live in captivity in any form of hive.' This is more or less true of *Apis dorsata* (Rock Bee) and *A. florea* (Little Bee), but *Apis indica* will live in a hive for some time. The trouble is that it will not (as a rule) settle down in a hive permanently, but usually swarms off again after a few months' occupation of the Hive. A Bee-keeper, however, who takes a little trouble with his Bees should not have much difficulty in keeping (say a dozen) hives occupied as they will not all swarm at once and, by keeping a look-out for wild and escaped swarms, new colonies can be got to take the place of those that have flown off. As a honey-producer I should not recommend *Apis indica* (Mr. Oakes tells me, for example, that he only gets about 6 lbs. of Honey per Hive per annum), but as a pollinator, it should be well worth keeping in all Estate Districts where either Coffee or Tea is grown. Mark that I said in my paper (which you quote) that the recommendation was addressed to 'would-be bee-keepers in the plains.'"

### THE SCIENTIFIC DEPARTMENT, U.P.A.S.I.

**Methods of applying manure.**—A Correspondent has called attention to the fact that differences of opinion exist among planters as to the best method of applying manure to coffee. Some spread the manure on the surface of the ground in a circle round the tree corresponding with the ends of the branches and approximately some four inches wide, and this is covered with refuse and leaves lying near by. Others consider this method of applying manure is insecure on any but flat land and consider the risk of loss by wash a serious one, and they cover the fertiliser with three or four inches of earth.

In order that plants may get food from the soil in which they grow it must be dissolved in water, and in a soil in which this plant food is finely divided and evenly distributed the roots of the plants will have a much better chance of getting the majority of the food than in a soil where this is not the case. As a general rule, therefore, it is best to broadcast all fertilisers and lightly work them into the top two inches of the soil. Where there is a good mulch of leaves these should first be swept up into heaps round the stems to the trees. During this process the ground should not be scraped and the half-rotten mulch mixed with the roots, and soil should not be disturbed. On the swept surface between the rows the manure should be broadcasted and spread as evenly as possible. The leaves should finally be spread back over the fertiliser and soil as evenly as possible. Where there is no mulch the manure should be evenly broadcasted and lightly worked into the top soil with a manott fork. These methods of applying manures will give better results than applying them in eyebrow pits or trenches, or any other method of local application. Manure thus applied is apt to remain in the same condition in which it was put out for a long while. In the case of Lime and Basic Slag, and fertilisers which are required to have a physical as well as a chemical effect upon the soil, it is absolutely essential that they should be as evenly and widely distributed as possible. Again the more insoluble the fertiliser is the more need there is for mixing it with the soil as much as possible. Soluble fertilisers are dissolved by the dew and rain and travel in a dissolved state for some distance through the soil before they meet with some substance which acts chemically on them and fixes them in the soil. Thus a soluble fertiliser like Superphosphate, for instance, is more likely to become intimately mixed with the soil by natural means than Bone Meal, for instance, which should be spread over the surface in order to become mixed with the soil by subsequent cultivation.

There may be special cases of course where broadcasting is not possible, such as on very steep hill sides, but even here if the land is properly treated to stop wash and conserve the top soil by means of contour drains and cover crops, broadcasting manure is quite feasible and little risk of loss is run. Probably the most general exception to the practice is in the case of young plants with a limited root range when it may be advisable to apply the manure near the plant where its roots can reach it. As a general rule, however, broadcasting and even broadcasted of manures is the best method of applying them.

**Fixation of Fertilisers by the soil.**—When a fertiliser is applied to the soil it does not simply remain mixed with the soil unaltered, but a chemical reaction takes place between the fertiliser and the soil. There is a general tendency for the soluble matter of the fertiliser to undergo a chemical change and become insoluble. This process is known as *fixation*. To take

an example, if a solution of sulphate of potash is allowed to percolate through a column of clay the solution draining out at the bottom of the column will contain scarcely a trace of sulphate of potash, but instead will contain an equivalent amount of sulphate of lime and other sulphates. The element Potassium in the sulphate of potash has been replaced by the element Calcium and as a result of this exchange an insoluble compound of potash is formed and retained in the soil. The potash compounds in fertilisers readily undergo fixation, the sodium and calcium of the soil being replaced by the potassium of the fertiliser. Fixation of potash occurs mainly in the surface soil where it is held in form insoluble in water, but soluble in dilute acids and so available to the plant. This process of fixation renders the potash well distributed in the soil and this is one of the reasons why soluble fertilisers often produce such good results. It will be noted that fixation takes place at the expense of the calcium and other alkaline elements in the soil which are lost by drainage after they are replaced by the potassium. It is in this way that a soil under cultivation to which fertilisers are constantly added gradually loses calcium and is apt to become acid. Hence the need for adding lime occasionally to soils not naturally well stocked with it, and the presence of this lime, as seen above, is extremely important, and absolutely necessary if fertilisers like potash are to be retained by the soil and prove beneficial.

Nitrogen in the form of nitrates cannot undergo this process of fixation because all the ordinary forms of nitrates are soluble in water. These fertilisers like nitrate of soda are apt to be washed out of the soil and lost in the drainage water. If saltpetre, which is a nitrate of potassium, be added to the soil, the potassium undergoes fixation but the nitrate does not, calcium and sodium nitrates being formed and these being soluble escape in the drainage water. From this it will be seen that fertilisers like nitrate of soda and saltpetre should not be applied to the soil before a time of heavy rains or the nitrates will be lost. They should rather be applied at a time when the soil is wet and no heavy rains are expected so that the plant roots will have a chance of obtaining the nitrates before they are washed out of their range.

Phosphates readily undergo fixation by combining with the aluminium and iron compounds in the soil and forming insoluble phosphates. These compounds are sometimes so insoluble that the phosphate becomes unavailable to plants and this happens more especially in the absence of lime, the application of which sets the phosphate free.

If very heavy dressings of potash and phosphate are applied to the soil what is not utilised is the first few years may undergo fixation to such an extent that it becomes unavailable as plant food, more especially if the soil contains much clay. Hence it is best to make light and frequent applications of fertilisers and not very heavy ones at long intervals.

Cattle manure and all kinds of manures alike undergo this process of fixation which indeed regulates the supply of plant food in the soil, and in studying the action of different fertilisers upon the soil the products of fixation are of prime importance.

*Kalisyndicate Manurial Experiments.*—Mr. Birnie, the Kalisyndicate representative in India who has succeeded Mr. Friedrichsen, is at present on a short tour in Coorg with the Scientific Assistant making final arrangements about the Experiment Plots there. From Coorg he will proceed to Mysore on a similar mission.

R. D. A.

**DISTRICT PLANTERS' ASSOCIATIONS.****Anamalai Planters' Association.**

*The Minutes of a Meeting of the General Committee, held at the Pathulotam Bungalow, at 5 p.m. on Saturday, 15th December, 1912.*

PRESENT.—Messrs. G. A. Marsh (Chairman), E. W. Simcock, B. A. Madden, C. R. T. Congreve, C. Howland and J. Hutton Robinson (Honorary Secretary).

*Agenda:* Roads and Communications, Electric Rope Way, etc.; Non-Service of Warrants, Customs Duty on Machinery for Tea, Coffee, Rubber, &c.; U. P. A. S. I. Representative on the London Chamber of Commerce, Hospital Affairs, Weekly Rice Issues.

1. *Wire Rope Way.*—The Committee were very thankful to Messrs. Barber and Pascoe for what they had done in the matter and Messrs. Walker Sons & Co.'s offer was accepted with thanks. On Messrs. Walker Sons & Co. putting in a rough estimate other firms might be consulted.

2. *Non-Service of Warrants.*—In reply to Mr. deSahis' letter of 26/10/12, and his proposed resolution under this heading it was resolved: "That this Association does not consider it advisable to do anything on the matter of his resolution until the resolution which the U. P. A. S. I. now have before Government is definitely dealt with, but, at the same time, Mr. deSahis' resolution will by no means be lost sight of."

3. *Customs Duty on Machinery.*—This Association strongly supports the movement of the U. P. A. S. I. that all machinery required for Coffee, Tea or Rubber work be made free of Customs Duty.

4. *U. P. A. S. I. Representative on London Chamber of Commerce.*—It was resolved: "That this Association records a hearty vote of thanks to Mr. John C. Sanderson for his services, and that it agrees to Mr. Gray Owen taking his place, but thinks it might be advisable if the services of one of the few well-known retired South Indian planters could be got to assist Mr. Owen in his duties."

5. *Hospital Affairs.*—The correspondence between Mr. Simcock and the Honorary Secretary was read. Mr. Simcock's offer to let the Sub-Assistant Surgeon remain on in the Stanmore Bungalow was recorded with thanks. The Honorary Secretary was requested to ascertain by whose permission the Medical Officer had lately left the District, and if the same is in order, that this Association respectfully request that intimation be sent to the Honorary Secretary about his leaving the District in future.

6. *Weekly Rice Issues.*—It was unanimously agreed that the weekly issues of rice are not to exceed Re. 1 for a man cooly and 12 annas for a woman.

(Signed) J. HUTTON ROBINSON.

*Honorary Secretary.*